US009333008B2

(12) **United States Patent**
Dodgen et al.

(10) **Patent No.: US 9,333,008 B2**
(45) **Date of Patent: May 10, 2016**

(54) **SERPENTINE SPINAL STABILITY DEVICE**

(75) Inventors: **Eric Dodgen**, Anthem, AZ (US); **Larry L. Howell**, Orem, UT (US); **Anton E. Bowden**, Lindon, UT (US)

(73) Assignee: **Brigham Young University**, Provo, UT (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 589 days.

(21) Appl. No.: **13/491,129**

(22) Filed: **Jun. 7, 2012**

(65) **Prior Publication Data**

US 2013/0150891 A1 Jun. 13, 2013

Related U.S. Application Data

(63) Continuation-in-part of application No. 12/709,240, filed on Feb. 19, 2010, now Pat. No. 8,663,286.

(60) Provisional application No. 61/520,280, filed on Jun. 7, 2011, provisional application No. 61/525,063, filed on Aug. 18, 2011.

(51) **Int. Cl.**

A61B 17/70	(2006.01)
A61B 17/00	(2006.01)
A61F 2/44	(2006.01)

(52) **U.S. Cl.**

CPC ***A61B 17/70*** (2013.01); ***A61B 17/7026*** (2013.01); *A61B 17/7007* (2013.01); *A61B 17/7032* (2013.01); *A61B 2017/00004* (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC A61B 17/7064; A61B 17/7065; A61B 17/7031; A61B 17/7026; A61B 17/7028; A61B 17/7029; A61B 17/701; A61B 17/7011; A61B 17/7019; A61F 2002/30563

USPC 606/246–279

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,945,053 A	3/1976	Hillberry et al.
4,267,608 A	5/1981	Bora, Jr.
5,405,408 A	4/1995	Pitkin

(Continued)

FOREIGN PATENT DOCUMENTS

KR	1020050080493	8/2005
KR	1020060113318	11/2006

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 12/726,816, filed Mar. 18, 2010; Peter Halverson; office action dated Oct. 11, 2013.

(Continued)

Primary Examiner — Jerry Cumberledge

(74) *Attorney, Agent, or Firm* — Thorpe North & Western LLP

(57) **ABSTRACT**

A spinal implant comprising a plurality of contiguous segments that define a segment array, said plurality of contiguous segments extending from a first side of the segment array to a second side of the segment array in an overlapping configuration, said plurality of contiguous segments operable to apply a torque to a degenerate spinal segment in each of three orthogonal axes. At least one mounting connection is configured to connect said spinal implant to a mounting mechanism, said mounting mechanism being configured to attach said spinal implant to said degenerate spinal segment.

18 Claims, 14 Drawing Sheets